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ABSTRACT

Two activities were undertaken for this examination of the growing potential of school library media programs to promote the development of higher levels of information literacy in college-bound students. First, visits were made to 30 high schools in Massachusetts which differed in their library programs as well as in a wide range of quantitative measures, including size of student body, size of book and periodical collections, numbers of professional and support staff, size of facilities, and budgets. The second activity entailed reading books and articles relevant to information literacy and summarizing findings and impressions from a selection of these readings. Pertinent information relating to programs in individual schools is also discussed, such as general observations about the school library collection, the writing program, online databases and CD-ROM, and periodicals, microforms, and collection development. It is concluded that school library media programs have a growing potential to promote the development of higher levels of information literacy in college-bound students, particularly those who have been introduced to electronic technologies that access and retrieve information quickly. Ten recommendations are presented, and three appendixes provide the names of school library media centers and staff visited; data on collections of print materials; and lists of the 20 magazines most commonly requested by high school students as identified by three prior studies. (64 references/notes) (CGD)

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TO: Massachusetts secondary school librarians and media specialists visited, September, 1987 - February, 1988.

FROM: Joyce Merriam, Assistant Head, Reference Department, University Library, University of Massachusetts/Amherst

SUBJECT: Helping College-Bound Students Develop Higher Levels of Information Literacy: A Report On A Study Of Selected School Library Media Programs in Massachusetts.

DATE: August, 1988

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BACKGROUND

The purpose of my sabbatical leave, from September, 1987 to mid-February, 1988, was to update and expand work I completed in 1979 to study library instruction programs in secondary schools throughout Massachusetts. Emphasis in that study was placed on finding ways to help college-bound students make the transition from school to academic library.[1] In my new study, I planned to examine the growing potential of school library media programs to promote development of higher levels of information literacy in college-bound students, to better prepare them to make productive use of information resources available in college and university libraries. Information literacy is defined as the ability to not only locate but also evaluate and use information effectively.

Since 1985, the National Commission on Libraries and Information Science has been working to promote the role of the school library media program in teaching information management skills, believing that such skills should be an integral part of everyone's education. A paper entitled "Educating Students to Think: the Role of the School Library Media Program" was published in 1986 to provide a conceptual framework for examining the subject.[2] The paper presented both a political and an instructional perspective on the desirability of developing an information management skills curriculum now, in the late '80's, while conditions favor change to a more active instructional role for the school library media specialist.

One of the traditional roles of the school librarian has been to assist users with locating and using information. Because of present conditions, which include the impetus to teach critical thinking skills and the need to respond to rapid changes occurring in the information world, many school librarians believe that a much greater proportion of their time should be spent helping students develop the thinking skills needed to become information literate.[3] They are placing a higher priority on their teaching role, and are actively extending it into the new area of computer-based information literacy.

Curious as to the changing role of the library media specialist in Massachusetts, I planned to spend my sabbatical leave broadening my overview of the widespread differences I knew existed among library programs in individual schools. As noted in the recently approved Standards for School Library Media Centers in the Commonwealth of Massachusetts,[4] goals for education and the means to achieve them vary greatly throughout the state. These differences impact substantially on library media programs and on the ability of the library media specialist to carry out a role which should not be neglected in today's "information society:" that of promoting excellence in the way students are taught to value, locate and use the best available information.

DESCRIPTION OF PROJECT

Two kinds of activities occupied most of my time while on leave. The first centered on visits to schools; the second involved a careful reading of books and articles dealing with issues relevant to information literacy.

(1) Visits to Schools

I visited thirty high schools in Massachusetts, including eighteen that I had not visited in 1979.[5] All were publicly supported with the exception of Deerfield Academy, which is a private, independent school. Estimated student enrollments ranged from 220 to 2,200; the estimated size of book collections ranged from 6,000 volumes to over 48,000; periodical collections ranged from 15 titles to 336.[6]

Other quantitative measures of difference - numbers of professional and support staff, size of collections of audiovisual materials and software, size of facilities, budgets, etc., also varied widely in a comparison of schools. Clearly, state-supported standards have long been needed to spur on efforts to reduce major inequities in library services provided to students across the state. It is hoped that the newly adopted Standards will be used by administrators, school committees, and school library media specialists to help plan, develop, evaluate, and bring quality library media service to all students in Massachusetts.[7] If they are ignored, efforts to reduce inequities will probably fail.

Following my visits to schools, I compiled folders containing notes I had taken as well as copies of self-designed library orientation and instruction materials that individual librarians were willing to give to me. Other kinds of materials were collected as well: curriculum booklets, some on using high tech research tools in particular programs of study; research project and research paper manuals; a "Library Skills Program Analysis Document"; library skills pre-tests; newsletters which inform faculty of new acquisitions of materials and equipment; pathfinders; forms used to keep an informal record of assignments teachers have designed which make use of library resources; copies of selected assignments. These will be shared with library media specialists in Massachusetts who express interest in seeing them.

In a few schools, I had an opportunity to talk briefly with classroom teachers and other school personnel who had volunteered to discuss their reasons for having students use the library.[8] These interviews helped to improve my understanding of how different teaching styles and different educational goals affect the potential development of information literacy in students.

(2) Readings

There is much in the current literature dealing with concerns for improving the teaching of subject content as well as the teaching of learning processes. Concern for content, for example, is seen in recent books and articles which deplore a lack of "cultural literacy" in America[9] and, while there is ongoing debate over what citizens in America should know, reformers agree that Americans need to know more.[10]

At the same time, much research addresses productive teaching and learning styles, information-seeking behavior, and current advances in technology that are bringing about change in all of these areas. In the literature of library and information science, much is being written about the implications of these concurrent forces on the evolving role of the school library media specialist.

Findings and impressions drawn from a selection of these readings are summarized below, to call attention to the variety of factors that currently influence student development of information literacy.

SUMMARY OF SELECTED READINGS

(1) Teaching and Learning Styles

An excellent collection of teaching strategies, intended to provide a "current repertoire for teachers and curriculum makers," appears in the book by Bruce Joyce and Marsha Weil titled Models of Teaching.[11] Models selected for inclusion are backed by research and practical experience. All are adaptable to different learning styles and different content goals. Many contribute to the development of information management skills.

Of particular interest are the models grouped into an "information-processing family," which has as its long-term goal teaching students how to think effectively. Examples include an inductive thinking model, which involves students in collecting, organizing, and manipulating data and an inquiry training model, which involves students in exploring pre-selected ideas, its goal being to teach procedures of question-raising and disciplined searching.[12]

Other models are grouped into "the social family," which includes strategies for cooperative learning and group investigation. These take into account research findings that show some students to be intellectually stimulated by learning tasks that require social interaction.

Additional models are provided for use by teachers across the curriculum to help students learn more easily and effectively. Bruce and Weil suggest that "awareness of how to learn and how to improve learning results in a sense of mastery and control over one's future."[13] This, they say, is the most important long-term outcome of instruction.

Bruce and Weil make reference to support systems required by the various models of instruction. Some, such as the social science inquiry model, require a "very rich environment of information" in order to maintain an honest inquiry. Not only are "open-ended library resources" needed, but access as well to "expert opinion and other sources outside the school itself."[14]

Failure of teachers to use certain models is attributed most often to lack of adequate support systems. In other words, school systems which provide strong support systems, by so doing, also provide rich opportunities for teachers and students alike to develop a fuller range of successful teaching and learning styles.

Since Models of Teaching is widely used in teacher education programs, the implications of strategies it recommends are of interest beyond the confines of the classroom. One unmistakable implication is that strong support systems are needed to maximize opportunities for improving teaching and learning styles. The library media center is at the heart of that support system.

(2) Critical Thinking Skills

My readings on this topic included some that attempt to define critical thinking and identify skills essential to it.

Critical thinking as defined by Barry Beyer is "the process of determining the authenticity, accuracy and worth of information or knowledge claims."[15]

Stephen Norris defines it as "rationally deciding what to do or believe,"[16] while John McPeck suggests that "learning to think critically is in large measure learning to know when to question something, and what sorts of questions to ask. Not just any question will do."[17] He goes on to define critical thinking as "reflective scepticism."

Although there is a lack of agreement on a precise definition of critical thinking, a consensus has been reached on a list of ten skills essential to it:

-distinguishing between verifiable facts and value claims;
-determining reliability of a source
-determining factual accuracy
-distinguishing relevant from irrelevant information, claims or reasons
-detecting bias
-identifying unstated assumptions
-recognizing logical inconsistencies in a line of reasoning
-distinguishing between warranted or unwarranted claims
-determining strength of an argument[18]

Sternberg advises teaching students to think critically in a variety of curricular areas since good thinking in one area does not guarantee good thinking in another.[19] Others point out that a prerequisite of critical thinking is that one must have a good foundational knowledge of the field in question, so time must first be spent in acquiring basic information. McPeck stresses this consistently, cautioning those unpracticed in teaching critical thinking that "one cannot think critically about X until one knows something about X."[20] For this reason, be advises against attempting to teach critical thinking at the elementary school level.

At the secondary school level, however, there is agreement that teaching strategies can be designed to introduce students to critical thinking in meaningful ways. In social studies education, for example, promotion of the ability to think critically is a major goal. The ten critical thinking skills identified by Beyer are included in a more extensive list of "essential skills for social studies," contained in a report prepared for the National Council for the Social Studies in 1983.[21]

This report lists other skills considered essential for social studies: reading and writing skills; study skills; reference and information-search skills; technical skills unique to electronic devices, and so on. It begins with skills related to acquiring, organizing and using information, progresses to skills needed for effective social participation, and concludes with the recommendation that acquisition of the full sequence of skills be viewed as a goal equal in importance to acquisition of subject matter and democratic values.

Writers of the report call attention to research which finds that "youth who are most supportive of democratic values are those who practice investigation of issues in an open-supportive environment in the classroom."[22] This finding is used to underscore the desirability of encouraging student inquiry into social issues.

I was interested in the rationale for practicing social inquiry, because college freshmen typically choose to read and write on social issues too, if given a free choice of topics on which to write a documented essay. So many do this that I see it as a good example of particular attitudes and skills acquired in high school being carried over into the college environment.

I found the social studies report interesting in other respects also: (1) it presents a clear curriculum-related rationale for insuring availability of adequate information resources; (2) it identifies skills students need to participate effectively in social studies inquiry, and (3) it voices concern for improving both the teaching of subject matter and the teaching of learning processes. Overall, the report impressed me as a step in the right direction. I wondered how many school librarians knew about it, and had read it.

A point not stressed in the social studies report, or in Models of Teaching either, is the importance of making certain that appropriate, adequate information sources are available, and that students will know how to use them. This is often a critical part of the total lesson plan; it deserves greater attention, including clarification of the supportive roles of the school library media specialist, in the literature of curriculum development.

Other articles I read on critical thinking focused on factors that influence the development of critical thinking skills. In an article by Carolyn Hughes, for example, it is suggested that "the ways teachers structure their lessons and the kinds of questions they ask have a significant influence on the kind of thinking students do."[23]

This same point is stressed by William Taylor, English teacher at the Shepherd Hill Regional High School. During my interview with him, he spoke about spending the necessary time researching the topics he may choose to assign for inquiry beforchand, so that he knows what resource material is available in the school library. Choosing topics for which appropriate material is available, he structures questions for students so that no one source will provide sufficient data; several sources must be consulted, and opinions must be backed with facts. He feels that the phrasing of the question is all-important because, if poorly done, students can avoid thinking, and can rely on copying or summarizing from sources. "What you ask for," he says, " is what you get."[24]

Special praise should be given to all teachers who, like Mr. Taylor, do invest that extra preparation time, energy, and thought which must precede assignments involving use of resources for research. To use the words of Florence Shaw, library media specialist at Shepherd Hill, teachers like Mr. Taylor are "top-drawer."

Of interest, too, is the possible long-term impact of critical thinking instruction on student behavior. Writing on this topic, Stephen Norris has suggested that knowing how to think critically doesn't guarantee that a person will do so in everyday life. He argues that having skills in critical thinking is important, but not enough. In addition, a person must have an inner motivation which he terms "a critical spirit," or disposition to think critically about issues.[25]

Norris's view points to psychological needs underlying behavior. Some of my reading was in this area also.

(3) Information-Seeking Behavior

There are observable differences in ways students, teachers, and citizens in general, use libraries and other sources of information. A number of recent studies focus on psychological aspects of information-seeking behavior, in an attempt to better understand these differences.

In a 1981 article in The Journal of Documentation, T.D. Wilson points out that many factors other than a "need" for information play a part in a person's decision to seek information. Examples given are "the importance of satisfying the need, the penalty incurred by acting in the absence of full information, the availability of information sources and the costs of using them, and so forth."[26] While recognizing the importance of all of these factors, he challenges investigators to take a closer look at one of them: the psychological motivations underlying information-seeking behavior. He observes that studies to date have failed to look closely at why the information seeker behaves as he does.

Kathleen Dunn responds to Wilson's challenge in a study published in 1986 addressing psychological motivations for information-seeking in an academic environment. Her study identifies psychological needs causing undergraduates to seek information in the context of "continuing motivation," which is defined as the tendency, based on a continuing interest in a subject, to seek learning outside the classroom without external pressure to do so. She identifies the sources undergraduates chose to use and empirically establishes relationships between the motivating needs and the kinds of sources used.[27]

The results are interesting. Stated briefly: students with needs for self-extension and approval by others tended to use friends and family as information sources; students with needs for intellectual stimulation and professional success tended to use libraries and experts as information sources; students with strong needs to be successful in college tended to seek friends and libraries as information sources rather than family.

In the context of continuing motivation, undergraduates used a variety of information sources. When sixteen sources were ranked in order of their importance in providing information; teachers were ranked first, university libraries second, experts in field third, personal library fourth, friend fifth, public library seventh, and so on. Dunn found that this pattern supported other studies[28] that show speed and content to be crucial factors in the choice of an information source, and noted that authoritative, informal sources are often chosen first, followed by authoritative, formal sources.[29] In light of these findings, Dunn suggested that it was not surprising that many students do not use the library unless required by the teacher to do so.

Of equal interest, perhaps, is the finding that some students do not require external pressure to seek information in libraries. Some do have strong motivation to learn outside the classroom but, like less motivated students, also consider speed and content to be significant factors in the choice of information sources.

Writing in the Review of Educational Research, Martin Maehr suggests that continuing motivation, or continued willingness to learn, may well be the critical outcome of any learning experience,"[30] for two reasons: first, because increasingly complex societies require continuous learning and, secondly, because long-term competence in skills requires continuous practice. He uses learning to read as an example, noting that teachers can direct some practice in reading, but it is continued reading, not just instruction in reading, that creates a reader.[31] Obviously, the same can be said of critical thinking skills, use of libraries, and information literacy.

(4) The Revolution in Technology

Products of the electronic revolution are appearing in classrooms and library media centers nationwide. Examples of existing products include microcomputers, compact discs, videodiscs, interactive videotext, on-line information services, cable television, hypermedia and so on. Interest in these products is widespread, since the new communications technology can help to serve the basic social functions of communications: to inform, to transmit the culture, to persuade, and to entertain.[32] Recent articles point to many positive benefits of the new media.

For libraries, the positive benefits include dramatic improvements in methods to manage data acceleration. Obvious advantages of speed and coverage, factors we are beginning to realize are extremely important to information-seekers, are offered by the new online services and CD-ROM products. These products offer another advantage too, as marketers of the products are pleased to point out: they offer immediate feedback on whether questions have been asked logically (e.g., by identifying chosen terms that were too broad, too narrow, or that required other word endings.) This feedback helps to develop skills in question negotiation and analysis, thereby helping to promote critical thinking.[33]

Providers of on-line information, such as DIALOG Information Services, and BRS Information Technologies, have recognized the potential of the student market, and now structure programs and prices to meet school needs. DIALOG's Classmate program, for example, has been designed to meet three teacher requests: fewer databases, simplified search language, and curriculum materials supplied by DIALOG. Special materials include workbooks for teachers and students, tests, overheads, and a videotape film explaining what Classmate is. The film is a promotional tool, to show to teachers and students, to school committees, and to boards of education.

In a recent presentation on Classmate, DIALOG's Ran Hock emphasized that "the heart of Classmate is how its applied."[34] He suggested five applications" (1) to increase awareness of information resources; (2) to promote use of information resources; (3) to contribute to an understanding of telecommunications; (4) to develop research skills including critical thinking; and (5) to help prepare students for the college environment, by introducing them to resources well beyond the scope of the card catalog and Reader's Guide.

The promotional strategies of the commercial providers have already made accessing electronic data bases one of the fastest-growing trends in high school computing today,[35] and the trend is extending downward, to reach middle schools and even elementary schools. Mary McMahon, Coordinator of Educational Services at BRS, has reported that hundreds of schools are going online to search data bases at BRS Information Technologies.[36] DIALOG, in competition with BRS for the school market, is introducing both its Classmate and its Classroom Instruction Program to schools, the latter program offering access to nearly 250 data bases at prices affordable to many schools.

The next step, according to Dialog's Anne Caputo, is to create mass demand for the new information access technology. To this end, commercial providers are encouraging secondary schools to incorporate the technology into the core curriculum, "both as a skill to be learned and as a tool to expand horizons of curiosity and intellectual endeavor."[37] Since students trained to use state-of-the-art technology in junior or senior high school can be expected to want similar services at public and academic libraries, the commercial services expect that demand for the new technology will increase. Anne Caputo compares current efforts to spark demand for the new products to efforts made in the 15th century, following Gutenberg's invention of the printing press, to exploit that tool. Exploitation of the printing press "languished for two centuries during which time compulsory education produced a sufficiently large literate populace to justify mass production in printing."[38] That lesson of history has not been lost on today's marketers of the new technology.

(5) Implications for the School Library Media Program

Learning to use information effectively is becoming increasingly important as the nation moves from a manufacturing to an information-based economy. Geeslin points out that "90% of jobs created in the U.S. in the last decade were related to the creation, processing or manipulation of information."[39] Business has become dependent upon telecommunications services to remain competitive in the global economy and, with money to invest in the new technology, business has readily supported the development of innovative services to improve productivity. Costs of the new services have become more reasonable as the market for them has expanded.

According to John Naisbitt, author of the best-selling Megatrends (Warner Books, 1982), the blue collar labor force in the United States will dwindle significantly by the end of this century, as more and more people are needed to fill "thinking" jobs in some way related to processing information.[40] Traditional literacy skills will still be needed, but new skills will be needed too, to prepare workers to communicate using electronic technologies. Naisbitt predicts a computerized future, in which people will be required to do more than simply punch buttons and read screens of text. Computers will change, interactive options requiring thoughtful selection will become prevalent and masses of people who have received schooling to become proficient in the new literacy skills will begin to reap economic and social benefits beyond the dreams of American workers in the nation's industrial heyday.

Exuding optimism, Naisbitt states his belief that America hasn't even begun to experience its full potential. He points to changes needed in our educational policies, however, noting that it is a mistake to load up students with information without teaching them how to learn. As the pace of change continues to increase, students will need to know how to keep on learning. Ultimately, he says, all whose lives are affected -- students, teachers, parents, school board, curriculum planners, taxpayers and the business community, must reconceptualize the goals of the schools, to insure implementation of a curriculum which prepares students for life in an information society. He stresses the point that teaching students how to learn -- to go out and find out everything they can about a subject they know nothing about, should be considered one of the essential goals of education today. [41]

Pennsylvania is one of the few states to date to take action at the state level to require schools to teach information searching skills, including use of new technologies. In 1984, governor Thornburgh announced ACCESS Pennsylvania: An Agenda for Knowledge and Information Through Libraries. The goal of the program is to make Pennsylvania's statewide library and information resources available to all residents. School libraries are given a leading role in the program because, as Thornburgh said, "the role of the librarian as a teacher of information searching skills is more important now than ever before."[42] Schools in Pennsylvania have been directed to fully integrate online search skills into the school library media program.

Pennsylvania Online: A Curriculum Guide for School Library Media Centers was published in 1985 outlining course objectives and student outcomes. It made reference to the 1985 National Commission on Libraries and Information Science report which advocated that children, in addition to being taught computer skills from an early age, "learn to use libraries and learn how to find and use information effectively." It labeled this skill the 'fourth R', "essential in the learning process from cradle to grave."[43]

Pennsylvania Online includes guidelines for an online curriculum at the high school level. Students discuss the impact of information in society, gather information about its uses, conduct a manual search, and develop an awareness of online searching as an information tool. Comparing the results of a manual search to results of a similar online search serves to illustrate advantages and disadvantages of both methods. The classroom teacher and school librarian guide students through the search process, helping students to select topics appropriate to the length of the assignment, the type and variety of materials available, and the academic ability of the individual student. The final project is an annotated bibliography which will be evaluated for appropriate descriptive content in annotations, relevance of sources to the topic selected, completeness of the bibliographic citation, variety of types of resources used (if appropriate to topics), etc. [44]

As one of the first curriculum guides of its type, Pennsylvania Online deserves the attention of planners outside the state of Pennsylvania who have not yet implemented a statewide plan for integrating online search skills into their school library media programs. Pennsylvania is a leader, not only in recognizing the important role school libraries can play in developing information literacy, but in setting up networks to promote sharing of resources throughout the state.

Recently, Pennsylvania libraries, under the leadership of the State Library have committed themselves to a telefacsimile network (FAX) to enhance an already comprehensive document delivery system.[45] The FAX network will facilitate rapid yet economical delivery of documents among a variety of libraries and other telefacsimile consortia. Informational services for citizens of Pennsylvania will be improved, and the state will have moved a step closer toward its goal of providing knowledge and information to its citizens through libraries. It is an impressive record of accomplishment at the state level.

At the school building level, library media specialists nationwide are becoming much more actively involved in promoting use of their services and collections in support of the educational process. In the literature on roles of the media specialist, several patterns and trends reflecting this change have emerged. One is the movement away from a passive approach to library service, which means "having materials and services available for use by students and faculty, but leaving initiation of contact up to the patron", to a more active role, which means reaching out to users, and becoming more directly involved in helping to teach the research process. [46] Direct teaching of library and information skills to users has become a major trend in the '80's, though observers agree that much more in this area remains to be done. [47]

Eisenberg calls attention to other roles that are emerging in response to the expanding world of information: "(1) collection management based on a unified media concept, (2) promotion of literacy and guidance in the use of media; (3) teaching information skills for an information society (through integration with classroom curriculum); (4) acting as a catalyst or change agent in the schools through awareness of 'cutting edge' technology and consultation on curriculum and instructional design; and (5) assuming information management responsibilites beyond the walls of the centralized library media facility."[48]

Eisenberg notes also that, in practice, each library media professional "creates his or her own role within a broad range of possibilities." "The primary challenge," he says, "is to narrow the gaps between theory and practice, and between internal and external expectation" ... so that "the users of library media services -- students, teachers, administrators, and parents -- must come to value, expect, and if necessary, demand high-quality library media programs."[49]

The readings summarized above contributed to my understanding of factors that might influence the role of school libraries in promoting higher levels of information literacy among college-bound students in Massachusetts. Knowing that Massachusetts is not Pennsylvania, that, indeed, no state-level bureau exists in Massachusetts to advise and give direction to school library media programs, I expected to find individual librarians creating their own roles, often reflecting constraints or benefits of particular local environments. My findings on factors contributing to information-literacy at the local level follow.

PROGRAMS IN INDIVIDUAL SCHOOLS

(1) General observations

In some schools, teachers have the perception that the library collection is inadequate for their purposes. As a result, the school library is by-passed as a resource, students obtaining materials to supplement textbooks elsewhere, if at all. Unfortunately, more than use of a particular library collection can be by-passed in this process, the most important missing element being informed guidance in personal selection of appropriate materials, and instruction, as needed, in locating and using them to fulfill clearly understood goals. Advance planning, including good communication between classroom teacher and librarian is important to make sure that adequate materials and instructional controls are in place before students attempt to use methods, procedures or resources unfamiliar to them. The library media specialists I visited saw a need for more advance planning and better communication between teachers and librarians as areas in need of improvement in schools today.

Library media specialists agree that the perception some teachers have of an inadequate library collection is sometimes accurate. Funding for libraries varies considerably at the local level in Massachusetts, a fact which impacts noticeably on the size and nature of collections in individual schools. In general, it can be said that most collections are in need of upgrading in one or more areas to meet Standards for School Library media Centers in the Commonwealth of Massachusetts (see, for example, Appendix II). The upgrading process requires adequate funding for materials and staff, and a plan which sets specific goals for library support of the curriculum in individual schools.

Admittedly, in schools where articulation of the curriculum is poor, where not all teachers know what is being taught outside of their own classrooms, it is difficult to develop a balanced library program. Needs for library instruction are more likely to be unrealized and unmet in these schools too. Certainly, where no over-all plan exists to integrate information management skills across the curriculum, it is unlikely that students will receive enough practice in developing them to result in a sense of control over even basic strategies for locating and using information in today's world.

(2) The Writing Program

The "back to basics" movement places renewed emphasis on the teaching of reading and writing. Teachers of all subjects are asked to help students develop text comprehension skills, so that they will know how to read to learn. Greater emphasis is being placed on writing to learn too as teachers require students to get substantially more practice in the kinds of writing they will be asked to do in their academic work and in life generally. Practice is the key word, accompanied by help from the instructor to meet each student's particular needs.

It can be argued that students who read well are more easily helped to write well, since good readers can learn to review their writing, looking for areas in need of improvement. Good readers can learn to gather information from printed sources too, since they know how books are organized and can recognize main ideas in the text.

One teacher who is convinced of a strong connection between good reading and good writing is Nancy Kline Piore, Preceptor in Expository Writing at Harvard University. She finds that most students today do not know how to read "either the prepackaged material in textbooks or real books."[50] To strengthen text comprehension skills and improve writing ability at the same time, she recommends assigning students an explication of a text, defining explication as "a concise but detailed reading, a superclose reading, a lucid, careful, elegant analysis of the style and content of a brief written passage."[51] She finds that the process of explicating a text helps students to understand how other writers write. They learn to identify elements of style and content that are effective for particular purposes and begin to get ideas for improving their own work. The method can be applied successfully to readings in many subject areas to illustrate how writers present information on particular subjects to particular audiences.

Many teachers like Ms. Piore are finding that students in their classes do not know how to read for content. Their students do not recognize main ideas in books or articles even if they do know how to locate them in the library, and they have difficulty taking notes using their own words. Some teachers find the problem so severe that they no longer assign research papers that require students to pursue subjects of their own interest, independently, in the library. Instead, teachers make multiple copies of readings they select on a topic. The entire class writes a documented paper on this topic after they have read and analyzed the materials together in class, and after they have received instruction on proper use of facts, statistics, ideas, quotes, etc.

The use of controlled sources to introduce undergraduates to basic research methods has become popular at the college level too, because the method has some definite advantages: each student is guaranteed adequate resource material; the temptation to plagiarize is removed; teachers are thoroughly familiar with the source material and can see exactly how each student makes use of it in a written report.

Guided use of controlled sources should enable students to carry out the immediate assignment more effectively, but also prepare them to make effective use of similar materials, independently, in the future. The current practice in some English departments, however, is to never require students to write a documented essay that involves them in independent use of the library. This practice obviously impacts negatively on the library, since students are never required to use it.

Traditionally, English departments have integrated library skills into their reading and writing programs. Thanks to the cooperation of English departments, librarians have been able to reach virtually all students in secondary schools for library orientation and, more importantly, for later instructional opportunities related to research activities which develop and reinforce library skills. Valuable opportunities to integrate library skills into other areas of the curriculum exist too, and are acted upon, but in most schools the English department provides the best opportunity to reach all students because English is a required course.

Fortunately, most English departments still share the philosophy of librarians that students need to acquire library skills and are willing to cooperate in planning assignments that see that they do. An example of this cooperative outlook appears in the text of Springfield Central High School's College Preparatory Program of Studies: English, Grades 10-12.

"Research and library skills are an integral part of the writing, reading, and speaking program. Students will become aware of the available library tools and their function. Appropriate selection and use of the tools will enable students to locate significant information, to verify data and conclusions, to discover substantial data to assist the decision making and evaluative process, and to introduce documentation formats for required reports."[52]

Agreeing with this philosophy, most English departments still require college bound students to write a library "research paper", so called because it requires students to build on their present knowledge of a subject by using library resources. Sources used in the written report are credited using standard rules for documentation. Whether the required report is a lengthy one, involving allotment of much of the term for preparation time, or one in a series of short documented essays, the kind of experience it provides is particularly valuable preparation for life in an "information society", for two reasons: (1) the student gains experience in locating and using relevant sources of information independently, and (2) the student acquires a working knowledge of commonly used standard procedures for documenting cited materials, thereby becoming more familiar with the details an interested reader would need to locate the cited material for personal use. All this is fundamentally important if we take seriously the goal of preparing students to seek out information for personal use independently, to keep on learning outside of the classroom.

At Palmer High School the librarian is Donna Guerin, who also happens to be Head of the English Department. Reading scores are high at Palmer, and student papers display evidence of improved writing skills. According to Ms. Guerin, factors contributing to improvements in writing include Palmer's return to a traditional English curriculum which focuses on reading and writing.[53] Writing is not limited to English exercises and literary topics, but includes other content areas as well.

Ms. Guerin actively promotes use of the library, reviewing curricula from each department to see how the library might be used in support of course work and, at the same time, afford opportunities for students to develop a good working knowledge of the library facility, it collections, rules and procedures, index system, and standard reference materials. She keeps a "progress chart" outlining library skills to be introduced or reinforced at each grade level, 9-12, and uses this as a planning device to schedule and follow-up on objectives to be met by library instruction sessions and course-related activities. Most teachers cooperate in planning some assignments that will introduce or reinforce library skills as well as provide meaningful course-related content. If there were no planning process and inter-departmental cooperation, it is unlikely that all library-related objectives would be met, or that students would become practiced library users aware of the many resources a library has to aid learning.

Library skills have been integrated into the core curriculum at Palmer in the following ways:

(a) 9th Grade -- Freshmen receive orientation to the library/media center, and complete worksheets in the library on using the card catalog, etc. Four English class periods are allotted for this. -- 98% of the freshmen take World History and are required to write a short report citing sources. The librarian meets with this class for a unit on indexes which targets Reader's Guide, the Social Issues Resource Series, and includes a review of subject headings. -- Freshmen learn to analyze the content of one article together, to look for main ideas, and to take notes. Overheads are used to demonstrate different, equally acceptable methods for taking notes. Following this session in the library, students continue to practice note-taking in English classes. -- A "Let's Travel" interdisciplinary unit involves all freshmen who are learning a foreign language in finding out more about a country in which that language is spoken (e.g., Spanish, French). The English, Science, Language and Math Departments plan assignments which require use of library materials to find information about countries. In the library, students are introduced to a wide assortment of relevant materials, presented in such a way that they will have no difficulty thinking of ways to use them to carry out assignments. For example, each student is asked to complete several short writing assignments for English. Suggested ways of using information they have learned about a country include keeping a journal about an imaginary trip, writing a letter home, etc. For Art, each student will prepare a visual presentation on the country. For Science, each student will write a short report on natural resources, food problems, or industry in the country. For Math, each student will find and use currency equivalency tables.

(b) 10th Grade -- All sophomores take Health. Since the Health teacher requires a paper, the English Department uses this requirement to teach the term paper process. The Librarian and Health teacher develop a list of topics; students select topics from the list, each student selecting a different topic. A minimum of three resources must be cited in the assigned paper (1 Reference source, 1 periodical article, 1 book), but students usually cite six sources. A library session is scheduled to review use of Reader's Guide and students receive handout copies of the list of periodicals available in the library.

The English Department works with the students to review note-taking methods. Footnoting is introduced since students will be required to cite sources. Two quotes and an interview will be required to give students experience citing these. Each student receives a copy of a handbook prepared by the English Department which contains a guide to the term paper process, samples of footnote and bibliography form, and two sample student papers.

The content of the paper will be graded by the Health teacher but the librarian will review note cards, advising students as necessary on selecting sources, and will also review the final paper for bibliographic form on a pass/fail basis. The librarian maintains a strong teacher role; other teachers always refer students to her for review of note cards and documentation.

Sophomore year, this one paper helps to fill requirements in three areas: Health, English, and Library. The Health teacher is pleased to read well organized, well written papers that incorporate information that has been analyzed and digested, not copied, from relevant sources.

(c) Grade 11 -- Students at Palmer are leveled in the 11th grade. College bound students evaluate their own reading and writing ability using approved criteria and place themselves in a group. Students know which group they should be in. Depending on their own reading ability, they choose books to read by authors who have been listed and ranked according to reading difficulty. Each student reads two books by the author he or she has chosen at the end of the sophomore year. This is summer reading. The librarian maintains a file in the library on authors, giving information on themes to help students select authors likely to interest them. In September, students will write a book report on one of the two books, the selection being made by the teacher.

Later in September, each student will compile a working bibliography of sources about the same author, prior to writing a 5-page critical paper on some aspect of the writer's work.

The library component for this writing assignment includes an introduction to specialized reference materials relating to authors.

(d) Grade 12 -- College bound students have an assignment similar to the one described above, except that it proceeds at a faster rate. One class session in the library is used to review sources on literary topics, but beyond this, students are on their own. They now know library rules, procedures, the function of relevant reference tools, can locate materials on the shelves unassisted, and know ways in which the librarian can help them to make effective use of available materials.

The school library stays open for an hour after school and may open at other times, e.g., Sunday afternoons, to enable students to work on library-related assignments. Teachers who feel that students will need extra time in the library to complete assignments make arrangements with the librarian to open the facility for extra hours. The Librarian receives strong administrative support, and can take compensatory time for hours worked outside the normal schedule.

Ms. Guerin is continuing to plan and develop ways to strengthen the library program at Palmer. To date she has been admirably successful in taking charge of significant areas of the curriculum, so that all college bound students graduate with a working knowledge of standard library tools and materials. Some students gain additional experience in using a broader range of library materials if they happen to take elective courses which require use of the library. The most noteworthy feature of Palmer's program, however, is that all college bound students receive guided practice each year in learning to use the library for a course-related purpose and, by senior year they are reasonably familiar with ways to use the library, independently, as a learning laboratory.

At Palmer, the impact of the reading and writing program on use of the library cannot be underestimated. It's clear that the Palmer English Department plays a major role in teaching students how to read and write to learn, and a major role in directing student use of the library to achieve objectives that reach beyond the classroom. From my perspective, the writing program at Palmer is far superior to writing programs in schools which graduate students who have never learned to make effective use of a library.

(3) Online Databases and CD-ROM

Several of the schools I visited were introducing students to online information services such as Dialog, The Dow Jones News Retrieval Service, Vu-Text, and Compuserve. Use of new technologies to teach information searching skills is by no means widespread in Massachusetts, but individual schools across the state are experimenting with both online and CD-ROM products, and more schools can be expected to join this group as time goes on.

Of the thirty high schools and two junior high schools I visited, three high schools and the two junior high schools already had 3-4 years of experience using Dialog. These "experienced" schools included Deerfield Academy, Brookline High School, Shrewsbury High School, the Edmund W. Thurston Junior High School (Westwood, Mass.) and the Shrewsbury Middle School. Two additional schools planned to go online in 1988: Groton-Dunstable Regional Secondary School, and Longmeadow High School, the latter using Bureau of Educational Technologies grant money to finance the project.

At the time of my visit, Groton-Dunstable was about to send eighteen of its teachers for formal Dialog training. The eighteen were to include the Computer Coordinator, the librarian, heads of the English, Science and Art Departments, the school nurse who teaches health, and teachers representing Physics and Chemistry, Learning Disabilities, Social Studies, Soviet Studies, and Contemporary Issues.[54] Hopes were high that Ran Hock's Dialog presentation would motivate many of the teachers to gain experience searching online, to enable them to find ways of incorporating the new technology into the curriculum.

Inservice training was being offered to teachers in most of these schools too (e.g., Westwood, Brookline, Shrewsbury), librarians in each school agreeing that teachers must become comfortable with the new technology so that they can think of ways to use it, and be able to help teach their students how to use it.

I was particularly interested in the ways librarians and classroom teachers were using online databases to increase student awareness of information sources and to improve research skills. Of several examples that were given to me, two are selected for comment here: one which describes the method used by Roxanne Mendrinos at the E.W. Thurston Jr. High School to help students develop a search strategy,[55] and the other, an example of course-related use of Dialog at Shrewsbury High School.

At the Junior High School in Westwood, 7th and 8th grade students prepare to go online by using traditional sources first. Each student builds a list of at least five key words and related terms by using subject tracings from the Card Catalog. Correct spellings are carefully noted. Index terms and cross-references from encyclopedias, books and Reader's Guide may be used also. The latter is particularly useful for new terms and new ways of indexing a topic since it is issued frequently.

To become aware of the need to narrow most topics, students are taught to look for an outline of the topic in an encyclopedia and to pay attention to subheadings in indexes (e.g., in an almanac, Meats-pricing).

Finally, students are asked to write two pages containing information they already know about the topic before they go online. This preliminary work enables students to give direction to their search when a menu of choices is given to them online. They will be permitted to print off the full text of selected articles that contain information to supplement what they already know.

Students realize that online searching and text retrieval is expensive and recognize the value of preparing to conduct an efficient search. It's less easy to draw attention to cost factors associated with an efficient manual search. This is one reason, I believe, that students are more easily motivated to develop a search strategy for retrieving online information than they are for searching print sources alone.

At Westwood, Dialog, Compuserve and the Academic American Encyclopedia on CD-ROM are used in various ways to demonstrate their value as supplements to traditional sources of print and nonprint information. For example: Compuserve's electronic mail feature is used to contact other classrooms interested in exchanging ideas and information with classes at Westwood; students create their own database on World Leaders and keep it up-to-date.

By engaging in activities such as these, junior high students at Westwood gain experience in using the full range of tools available today to find, retrieve and store information useful to society. They are off to a good start in acquiring the kinds of experience needed to develop levels of information literacy higher than those developed by students just a decade ago.

At Shrewsbury High School, students in Ms. Tompkins 9th grade Economics class receive guidance in research using current materials. Magazines and newspapers are considered suitable resources, since the teacher wants students to see that economic concepts impact on the real world, daily, in ways that affect the average person.[56] For these students, The Magazine Index and the National Newspaper Index are appropriate indexes to search online.

Students choose their own topics, but receive some help with this from the teacher. When they are given instruction in accessing information by computer, they can see that certain topics are too general (e.g., the term "sneakers" may pull up 5,000 articles) and will have to be made more specific (e.g., a particular brand or type of sneaker will be a better choice).

Working in groups of 3-5 students, they have five days to work on their research project and use the computer room. They print off 5-7 references and prepare a bibliography card for each one. The teacher looks at the references (checking date, article title, descriptors and source) and recommends at least one good article for each student. Some sources may not be recommended because of level of difficulty. (Teachers at Shrewsbury are still feeling their way in this area, and admit to making occasional errors in selecting sources that are too difficult for individual students. Later in talking with the Computer Aide, I suggested that Katz's Magazines for Libraries[57] might be useful to them, since it does provide helpful information about specific magazines, including purpose, biases, and audience level -- general, special, academic, and high school).

Once the teacher has approved the selection of articles, the full text of these articles will be printed off by an assistant in the computer room. Each student will review one of the articles, highlighting key ideas and inserting marginal notes. These are transferred on to note cards, use of sentences not allowed. Each student rates the articles (good, excellent, etc.) on the back of his bibliography card. The teacher will keep a file of these cards to use as a selection tool in making future assignments.

An oral presentation on the topic follows. Students may use their note cards, but not read directly from them. They may also use visual aids, such as signs and posters, if they feel this would clarify or reinforce some aspect of the presentation.

Grading will take into account a number of factors: e.g., overall presentation, content relating to economic concepts, how well the student worked as a team member, and effectiveness of the visual aid. There is a possible score of 110 so that students who are weak in one area but strong in others will still receive a good grade.

In talking with teachers and librarians at the many schools I visited, I became much interested in the teaching strategies being used in the library and in the classroom to contribute to student development of information management skills in support of different content goals. I was left with the impression that a collection of these strategies, with examples of library resources required to support them, would be a useful handbook for new teachers and librarians. Such a handbook should make clear the shared role of classroom teachers, library media specialists, and computer coordinators in promoting student development of information literacy.

Strategies for using CD-ROM products with students are beginning to emerge. The Academic American Encyclopedia on CD-ROM was in use at four of the libraries I visited (Shrewsbury, Westwood, Brookline, and Chicopee). Strategies for using it include (1) as a tool to help students understand the principles of on-line searching (Brookline); (2) as a tool for empowering students taking English as a Second Language (Brookline)[58]; (3) as a tool for empowering lower-level students and sparking their interest in seeking information (Chicopee)[59]; (4) as an introduction to new technology for storing, accessing and retrieving information (important to all libraries).

The new electronic information access tools are proving to be exceptionally popular. They are a positive attraction in the library, enticing large numbers of students to use them to find at least some useful information quickly. Printers are popular too, enabling students to print off legible copies of references they select with the help of user-friendly menus, help screens and special function keys. Principles of guided practice are programmed right into some systems, such as the electronic encyclopedia, allowing students to correct their own errors in reasoning and help themselves to find the information they need. Most promising is the discovery that students will use these tools out of sheer curiosity, without being required to do so.

For the first time, it seems to me, there is genuine hope that all students can be motivated to use the library. Products of the electronic revolution are changing student attitudes toward libraries and the services they can provide. Overall, the changes are positive, suggesting to curriculum planners exciting new ways to prepare students for lifelong learning.

(4) Periodicals, Microforms and Collection Development

Periodicals on microfiche or microfilm are being acquired for use in greater numbers of high school libraries today for several reasons: (1) the space-saving format makes possible easy retention of extended backfiles; (2) student frustration is lessened because needed articles are available, not lost, mutilated or stolen; (3) schools that give students experience in online database searching want immediate access to high-use periodical titles and find that it is less expensive to purchase them in microformat than it is to print out full-text copies from online sources.[60]

Exactly which periodicals should be retained in a collection serving high school students, and for how long, has been the subject of several research studies.[61] Results of the studies have confirmed Bradford's Law, which states that in any library, for any topic researched, a relatively high number of references will be found concentrated in a few periodical titles. In the high school studies, the popular titles were defined as those most often referenced by students in preparing their research papers. The high use periodicals numbered about twenty. A comparison of three lists of titles, resulting from three separate studies, showed a remarkable similarity in the titles actually used by high school students. These lists are reproduced in Appendix III.

The Mancall & Drott study also showed that a retention period of five years would have provided 60% of the articles cited by students. Ten years of back issues would have provided 74%; holdings for twenty years would have provided 85%.[62] The conclusion drawn was that school libraries with limited funds for subscriptions should reassess their subscription policies with a view toward allocating funds for titles that have the greatest potential use. In many libraries, holding fewer titles for longer periods of time would serve the actual needs of students better than holding a great many titles for only short periods of time.

As shown in Appendix II, the size of periodical collections in libraries I visited varied greatly. Most retained backfiles of titles indexed in Reader's Guide for 2-5 years only, since they would have difficulty finding storage space for extensive files. Based on conclusions of the Mancall-Drott study, however, some of these libraries may want to reallocate subscription funds, cancelling some current subscriptions, if necessary in order to provide better in-depth coverage of core titles in microformat.

A few of the libraries I visited (e.g., Auburn, Brookline, Groton-Dunstable) had acquired Information Access Company's TOM (Text on Microform) collection which provides an index on microfilm to over 100 of the magazines most often found in school libraries, plus full-text coverage of 60 of those magazines on microfiche. It is updated monthly, each reel of film cumulating over 6 years of indexing. Like the Magazine Index, produced by the same company, it is proving to be a popular alternative to Reader's Guide, providing easy, speedy access to indexing for recent years on rapid output microfilm. All twenty of the titles in the Mancall-Drott list of popular periodicals are in the TOM microfiche collection. Articles which are available on fiche are designated by a number which appears alongside the article entry in the index. The number appears on the fiche too, serving as a call number for locating the article.

At Groton-Dunstable, the box containing the TOM collection is placed beside a fiche reader/printer adjacent to TOM, making it easy for students to find and print articles selected for use. Students like the system, including those who are ordinarily slow to learn how to use periodical indexes. Again, the power of the machine to fascinate and attract users to the library is unmistakable.

Brookline librarians point out that TOM does not provide cover-to-cover consecutive filming of all of its journals, so cannot be used as an exact substitute for normal subscriptions. However, it does provide ready access to a broad range of articles useful at the high school level in a format suitable for retention.

Dialog also makes possible full-text retrieval of many of the articles indexed in the online version of the Magazine Index. Commercial providers of information services are using new technologies to overcome some of the problems students associate with use of libraries: speed of access, scope of the collection, and availability of materials when needed. It is a very encouraging sign.

At Auburn High School, students are given the additional benefit of free photocopy service. Students using TOM or other library materials can leave photocopy request forms in specially designated pockets attached to a bulletin board. A library aide will make the photocopies during the day so that students can pick them up at the Circulation Desk later on.

Auburn also subscribes to all 88 volumes of the SIRS series, has current subscriptions to 150 periodicals, and has a card file union list of periodical titles held by the six other high schools in its regional consortium as well as by the Worcester Public Library. Detailed holdings are not recorded in the file but a phone call check can be made by the librarian for students interested in locating a journal not available at Auburn High.[63]

I mention these facts about the Auburn collection just as one example of a school library which offers students above average services relating to use of periodicals. In contrast, some of the schools I visited had much less to offer students. Some have no telephone in the library, no reader/printer, severely limited backfiles of titles with great potential use, and no union lists to help students locate materials elsewhere. Like Auburn, however, they are sending an increasing number of their students on to college (Auburn sends 60% and I believe this is not atypical). Students are graduating from high schools in Massachusetts with expectations about libraries as varied as the library programs in individual schools are themselves. Evidence is not hard to find to underscore the importance of the new Standards for School Library Media Centers in the Commonwealth of Massachusetts which, if taken seriously, could help to reduce inequities in programs offered to students throughout the state.

CONCLUSIONS & RECOMMENDATIONS

It is clear that school library media programs do have a growing potential to promote development of higher levels of information literacy in college-bound students. This is true in part because new technologies are making it possible for school libraries to access and retrieve information from resources well beyond the scope of a small card catalog and Reader's Guide. High School students who have been introduced to services such as Dialog and the electronic encyclopedia will be coming to college with much more sophisticated views about the expanding world of information and the new tools that are being developed to make it available for use at home, at school, and in the workplace.

The fact that the new electronic technologies do make it possible to access at least some types of useful information more quickly is of key importance. Behavior studies have shown that speed of access to useful content is exactly what information seekers want. This is good news to marketers of electronic information services, and to librarians too, if the new products are the catalyst we need to motivate more students to use informational resources to learn.

At present, few high school libraries in Massachusetts have reference tools or databases which are online or on compact disc. This does not prevent library programs in these schools from promoting higher levels of traditional information literacy, but it does prevent them from expanding into the new area of computer-based information literacy, an area already of interest to teachers in classrooms in these same schools. Librarians have an instructional role to play in this area too, since electronic publishing media are becoming important supplements to other types of media traditionally used by students in academic libraries. Students need to understand how each type contributes to the total resource of information available to them, and develop the thinking skills required to select appropriate resources to learn more effectively now, and keep on learning independently in the future.

RECOMMENDATIONS

1. The new 1987 Standards for School Library Media Centers in the Commonwealth of Massachusetts should be used to help upgrade library services for students in schools statewide.

2. Promotion of information literacy, with emphasis on guided practice to develop the thinking skills needed to locate, evaluate and use information effectively, should be a goal integrated into the core curriculum of each secondary school.

3. The library media specialist should become actively involved in helping to plan the curriculum, to make certain that students do receive meaningful opportunities to develop a lasting working knowledge of standard library resources and reference tools.

4. School librarians should keep informed of developments in new technologies such as CD-ROM and, as budgets and grant monies permit, acquire some that are favorably reviewed for use in secondary school libraries.

5. The literature of curriculum development should stress the importance of advance planning and communication with the school librarian to make certain that appropriate, adequate information sources are available, and that students will know how to use them.

6. Ways should be found for school libraries and librarians to receive recognition through the Chapter 188 Lucretia Crocker Fellowship Program,[64] which provides opportunities to showcase and disseminate outstanding teacher-initiated educational programs throughout Massachusetts.

7. Efforts should be made by administrators and librarians in schools which have excellent library/information skills programs, to attract practice teachers to those schools, to see and learn firsthand how library media resources are used to help students learn.

8. Backfiles of periodical titles which have the greatest potential use to high school students should be retained in microformat for at least 10 years. (see Appendix III).

9. Controlled sources selected by the teacher/librarian should be used in introductory courses to familiarize students with key resources and the ways they should be used.

10. By junior and senior years, grades for student research papers and projects should take into account how well each student selected and used appropriate informational resources to extend his or her knowledge of the research topic.

Students who have learned how to learn, and how to seek out information to improve their own learning, are well prepared to continue their education at the college and university level. There, too, the library will provide them with a strong support system for student-centered learning.

APPENDIX I

School Library Media Centers and Staff Visited Between
September, 1987 - February, 1988

	High Schools	Professional Librarians and Teachers Visited (Department noted for teachers)
1.	Amherst-Pelham Regional H.S.	Isabel Ryavec
2.	Andover H.S.	Jean E. Pendergrass
3.	Auburn H.S.	Robert Devine
4.	Brookline H.S.	Syrul Lurie Beverly Shinn Lynn Cohen Carolyn B. Markuson, Supv. Libraries & Instr. Materials
5.	Burncoat Sr. H.S. (Worcester)	Delores Lombardi
6.	Chicopee H.S.	Virginia M. Stahlsmith
7.	Deerfield Academy	Beverley VonKries Tina Cohen
8.	Doherty Memorial H.S. (Worcester)	Marilyn E. Hildick Carol McGrain - English
9.	Frontier Regional H.S. (So. Deerfield)	Janice C. Dore
10.	Groton-Dunstable Regional Secondary School	Dorothy Davis
11.	Holyoke H.S.	Dianne Booth
12.	Hopedale Jr.-Sr. H.S.	Laurie Wodin
13.	Longmeadow H.S.	Peter L. Bergeron William Kirkpatrick - English Maria Ianzito - History
14.	Lunenberg H.S.	Katherine E. Lowe
15.	Melrose H.S.	Gladys W. Katz
16.	Minnechaug Regional H.S. (Wilbraham, MA)	Patricia W. Osmond
17.	Monson Jr.-Sr. H.S.	Beverly Sangermano
18.	Narragansett Jr.-Sr. H.S, (Baldwinville, MA)	Catherine B. Reilly
19.	North H.S. (Worcester)	Janet Conlin
20.	North Andover H.S.	Janet DiGianni
21.	Northampton H.S.	Jacqueline Henning
22.	Palmer H.S.	Donna Guerin
23.	Shepherd Hill Regional H.S. (Dudley, MA)	Florence Shaw Peter Chaplin - Social Studies Joseph Haebler - History Michael Sullivan - Social Studies William Taylor - English Anthony Surozenski - Science
24.	Shrewsbury Sr. H.S.	Isobel Chang Bonnie Labelle - English Thomas Plati - Computer Coordinator Barbara Streuli - Computer Aide Marianne Tompkins - Business

25. Smith Academy (Hatfield)	Cynthia Phelps
26. South H.S. (Worcester)	Patricia McKeon
27. South Hadley H.S.	Ann Powers
28. Springfield Central H.S.	Georgene M. Gelinas
29. Wachusett Regional H.S. (Holden)	Bobbie Chase
30. Watertown H.S.	Rosemary Grose

Junior High and Middle Schools

1. Burncoat Middle School (Worcester)	Norma Mailberg
2. Chestnut Hill Community School (Belchertown)	Ruth Peck
3. E.W. Thurston Jr. H.S. (Westwood)	Roxanne B. Mendrinos

Elementary Schools

1. Mosier School (South Hadley, Grades 3-6)	Mary Ellen Stroud
2. Plains School (South Hadley, K-2)	Mary Ellen Stroud

APPENDIX II

COLLECTIONS OF PRINT MATERIALS

Minimal - Level One

Books: 7,500 vols. or 15 per student, whichever is greater

Periodicals, including newspapers: 20-49

Students (approx. no.)	Grades	School	Estimated size of print collections Fall 1987	
220	7-12	Smith Academy(Hatfield)	6,000 vols.	24 pers.
350	7-12	Hopedale Jr.-Sr. H.S.	6,000 vols.	35 pers.
473	9-12	Lunenberg H.S.	7,300 vols.	25 pers.
700	7-12	Groton-Dunstable Reg. Secondary School	10,000 vols.	50 pers.
850	7-12	Narragansett Regional Jr.-Sr. H.S. (Baldwinville)	10,000 vols.	56 pers.
950	9-12	Burncoat Sr. H.S. (Worcester)	13,000 vols.	53 pers.
1000	9-12	North H.S. (Worcester)	16,413 vols.	30 pers.
1300	9-12	South H.S. "	14,000 vols.	15 pers.
2000	9-12	Springfield Central H.S. (Students here use the City public library heavily)	17,000 vols.	30 pers.

NOTE: Level 1 - 3 quantitative guidelines are taken from Standards for School Library Media Centers in the Commonwealth of Massachusetts (1987), p. 26. As noted there, these are only general guidelines "because programs of service vary, and currency and quality are as important as quantity."

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COLLECTIONS OF PRINT MATERIALS

Average - Level Two

Books: 12,000 vols. or 20 per student, whichever is greater

Periodicals, including newspapers: 50-124

Students (approx. no.)	Grades	School	Estimated size of print collections Fall 1987	
425	9-12	Palmer H.S.	14,000 vols.	63 pers.
500	7-12	Monson Jr.-Sr. H.S.	12,000 vols.	54 pers.
500	7-12	Frontier Regional H.S. (South Deerfield)	15,000 vols.	40 pers.
930	9-12	*Watertown H.S.	15,000 vols.	54 pers.
950	9-12	*Chicopee H.S.	14,000 vols.	75 pers.
950	10-12	Melrose H.S.	23,000 vols.	24 pers.
995	9-12	Amherst Reg. H.S.	18,000 vols.	160 pers.
1000	9-12	*Northampton H.S.	15,000 vols.	110 pers.
1000	9-12	Minnechaug Regional H.S. (Wilbraham)	20,000 vols.	75 pers.
1029	9-12	*North Andover H.S.	16,000 vols.	65 pers.
1180	10-12	Andover H.S.	22,000 vols.	125 pers.
1300	8-12	*Shrewsbury H.S.	15,000 vols.	50 pers.
1322	9-12	Doherty H.S. (Worcester)	21,000 vols.	30 pers.
1400	9-12	*Holyoke H.S.	14,000 vols.	85 pers.
1700	9-12	*Wachusett Regional H.S.	14,000 vols.	87 pers.
2200	9-12	*Brookline H.S.	30,000 vols.	95 pers.

*Below average for no. of vols. per student. However, in some cases these statistics are misleading, because a few of these libraries also have access to online information sources. When other factors in addition to size of collection are taken into account, some of these libraries would be considered exemplary.

COLLECTIONS OF PRINT MATERIALS

Exemplary - Level Three

Books: 20,000 vols. or 24 per student, whichever is greater

Periodicals, including newspapers: 125+

Students (approx. no.)	Grades	School	Estimated size of print collections Fall 1987	
550	9-12	Deerfield Academy (private independent school)	43,000+ vols.	336 pers. (includes micro-text; not all currently rec'd)
650	9-12	Auburn H.S.	18,000 vols.	150 pers.
988	9-12	Longmeadow H.S.	29,000 vols.	125 pers.
1300	9-12	Shepherd-Hill Regional H.S. (Dudley, MA)	27,000 vols.	125 pers.

APPENDIX III

Twenty Magazines Most Commonly Requested by High School Students

Boise Study (1981)	Mancall/Drott Study (1983)	Mancall/Deskins Study (1984)
1. Newsweek	1. Newsweek	1. Time
2. Time	2. Time	2. Newsweek
3. U.S. News & World Report	3. U.S. News & World Report	3. Science
4. Sports Illustrated	4. Sports Illustrated	4. U.S. News & World Report
5. Business Week	5. New Republic	5. Science News
6. Science News	* 6. Saturday Review	6. Psychology Today
* 7. Hot Rod	7. Scientific American	7. Science Digest
8. People	8. Science Digest	8. American Heritage
9. Seventeen	9. Science News	9. National Review
*10. Consumer Reports	10. Nation	10. Reader's Digest
11. Scientific American	11. Reader's Digest	11. New Republic
12. Reader's Digest	12. Business Week	*12. New York Times Magazine
13. Good Housekeeping	13. National Geographic	13. People
14. Science Digest	*14. America	14. Seventeen
15. Science	15. American Heritage	*15. Grand National Scene
16. American Heritage	16. Science	*16. McCall's
17. Nation	*17. Current History	*17. Editorial Research Reports
*18. Popular Mechanics	*18. Congressional Digest	18. Good Housekeeping
19. Psychology Today	19. Psychology Today	19. National Geographic
*20. Outdoor Life	20. National Review	20. Scientific American

*Title appears in only one of the three lists. Title no. 15 in list 3 (1984) is clearly of local interest in the school where the study was conducted.

Recommendation: A core collection of popular titles should be available in libraries serving high school students. To meet greatest potential use, core titles should be retained for at least 10 years.

REFERENCES AND NOTES

1. Joyce Merriam, "Helping Students Make the Transition from High School to Academic Library: A Report on a Study of Selected Library Instruction Programs in Massachusetts," 1979. [University of Massachusetts, Amherst] (ERIC No. ED 176 783).

2. Jacqueline C. Mancall, Shirley L. Aaron, and Sue A. Walker, "Educating Students to Think: The Role of the School Library Media Program," School Library Media Quarterly 15 (Fall, 1986): 18-27.

3. Mancall, p. 19.

4. Standards for School Library Media Centers in the Commonwealth of Massachusetts. Final Draft Adopted by the Board of the Massachusetts Association for Educational Media, Oct. 14, 1987. Boston, 1987.

5. For a list of these and other schools visited, see Appendix I.

6. See Appendix II. The statistics are based on estimates given to me at the time of my visit and are not in all cases exact. They are useful, however, as one indicator of quantitative differences in learning resources available in school libraries.

7. Standards, Introduction," p. iv.

8. Acknowledgements are made in Appendix I.

9. Eric D. Hirsch, Cultural Literacy: What Every American Needs to Know, Boston: Houghton Mifflin, 1987.

10. "What Americans Should Know," U.S. News and World Report 103 (Sept. 28, 1987): 86-94.

11. Bruce Joyce and Marsha Weil, Models of Teaching, 3rd ed., Englewood Cliffs, N.J.: Prentice-Hall, 1986, p. 21.

12. Joyce, p. 55-69.

13. Joyce, p. 99.

14. Joyce, p. 299.

15. Barry K. Beyer, "Critical Thinking: What is it?" Social Education 49, no. 4 (April, 1985): 276.

16. Stephen P. Norris, "Synthesis of Research on Critical Thinking," Educational Leadership 42, no. 8 (May, 1985): 40.

17. John E. McPeck, Critical Thinking and Education, New York: St. Martin's Press, 1981, p. 7.

18. Beyer, p. 272.

19. Robert J. Sternberg, "Teaching Critical Thinking, Part 2: Possible Solutions," Phi Delta Kappan 67, no. 4 (Dec., 1985): 278.

20. McPeck, p. 160.

21. National Council for the Social Studies, Task Force on Scope and Sequence, "In Search of a Scope and Sequence for Social Studies," Social Education 48, no. 4 (April, 1984): 260-261.

22. National Council, p. 257.

23. Carolyn S. Hughes, "Teaching Strategies for Developing Student Thinking," School Library Media Quarterly 15 (Fall, 1986): 34.

24. Interview with William Taylor, Shepherd Hill Regional High School (Dudley, Mass., 20 October 1987).

25. Norris, p. 40.

26. T.D. Wilson, "On User Studies and Information Needs," The Journal of Documentation 37, no. 1 (March, 1981): 8.

27. Kathleen Dunn, "Psychological Needs and Source Linkages in Undergraduate Information-Seeking Behavior," College and Research Libraries 47, no. 5 (Sept., 1986): 475-481.

28. Andrew P. Hardy, "The Selection of Channels when Seeking Information: Cost/Benefit vs. Least-Effort," Information Processing and Management 18, no. 6 (Sept., 1982): 289-293.

29. Dunn, p. 479.

30. Martin L. Maehr, "Continuing Motivation: An Analysis of a Seldom Considered Educational Outcome," Review of Educational Research 46, no. 3 (Fall, 1976): 444.

31. Maehr, p. 444.

32. William J. Donnelly, The Confetti Generation: How the New Communications Technology is Fragmenting America, New York: Henry Holt, 1986, p. 23.

33. Anne S. Caputo, "Online Service Offers Information as a Springboard," Media and Methods 23, no. 4 (March/April, 1987): 38.

34. Randolph E. Hock, "Classmate: Introducing Students to the Online Databases," presentation at Massachusetts Association for Educational Media, Annual Conference (Chicopee, Mass., Nov. 2, 1987).

35. Erica K. Lodish and Anne S. Caputo, "ReSearching on Line: Schools and Electronic Data Bases," The Computing Teacher 14, no. 7 (April, 1987): 58-60.

36. Mary McMahon, "Schools Online at BRS," BRS Bulletin 10, no. 3, 1986, p. 21.

37. Anne S. Caputo, "Dialog in the School: Use of Dialog's Classroom Instruction Program in Secondary Schools," Education Libraries 11, no. 1 (Winter, 1986): 5-7.

38. Caputo, p. 5.

39. Bailey M. Geeslin, "The Information Age -- Leader or Follower?" Paper presented at the 15th Annual Telecommunications Policy Research Conference, Arlie, Va., Sept. 27-30, 1987. (ERIC No. ED 287 517).

40. Charlotte Cox, "Megachanges in the Schools: An Interview with John Naisbitt," Curriculum Review 22 (August, 1983): 7.

41. Cox, p. 8-10.

42. "Introduction," in Pennsylvania Online: A Curriculum Guide for School Library Media Centers, Harrisburg, Pa.: Penn. Dept. of Education, 1985.

43. Pennsylvania Online, p. 34.

44. Pennsylvania Online, p. 4-26.

45. Mark Wilson, "How to Set Up a Telefacsimile Network -- The Pennsylvania Libraries' Experience," Online 12, no. 3 (May, 1988): 15-20.

46. Michael Eisenberg, "Changing Roles of the Media Specialist," Syracuse, N.Y.: Syracuse Univ., 1987, p. 2. (ERIC No. ED 284 532).

47. Eisenberg, p. 3.

48. Eisenberg, p. 4.

49. Eisenberg, p. 4.

50. Nancy Kline Piore, "Explication: Learning from Texts," Social Education 51 (April/May, 1987): 279.

51. Piore, p. 280.

52. Springfield Central High School. College Preparatory Program of Studies: English, Grades 10-12. Springfield, Mass.: Springfield Public Schools, 1986, p. 20.

53. Interview with Donna Guerin, Librarian and Head of the English Department, Palmer High School (Palmer, Mass., 9 October 1987).

54. Interview with Dorothy Davis, Director of Library Services, Groton-Dunstable Regional Secondary School (Groton, Mass., 29 January 1988).

55. Interview with Roxanne Mendrinos, Director of Library Media and Computer Applications, E.W. Thurston Junior High School (Westwood, Mass., 10 December 1987). See also the article by Ms. Mendrinos, "ROM: Research Strategies for a Lifetime," 28 Media and Methods (March/April, 1987): 8-11.

56. Interview with Marianne Tompkins, Business Department, Shrewsbury High School (Shrewsbury, Mass., 7 January 1988).

57. Bill Katz and Linda S. Katz, eds., Magazines for Libraries, 5th ed., New York: R. R. Bowker, 1986.

58. Interview with Syrul Lurie, Library Media Specialist, Brookline High School (Brookline, Mass., 15 January 1988).

59. Interview with Virginia Stahlsmith, Library Media Specialist, Chicopee High School (Chicopee, Mass., 19 November 1987).

60. Interview with Thomas Plati, Computer Coordinator, Shrewsbury High School (Shrewsbury, Mass., 7 January 1988). Shrewsbury had just placed an order for 20 periodical titles on microfiche to begin building backfiles needed to support online research using Dialog. Two microfiche readers and one microfiche printer were already in place and teachers had been notified that training on use of this equipment would be provided.

61. Jacqueline C. Mancall and M. Carl Drott, Measuring Student Information Use: A Guide for School Library Media Specialists, Littleton, Colorado: Libraries Unlimited, 1983: 91-97. Results of a study funded by the Idaho State Dept. of Education and conducted in the Boise Public School District (1981) are reported in Thomas H. Olsen, "Periodicals on Microfiche," Drexel Library Quarterly 21, no. 2. (Spring, 1985): 126-135.

62. Mancall and Drott, p. 93-94.

63. Interview with Robert Devine, Library Media Specialist, Auburn High School (Auburn, Mass., 11 December 1987).

64. 1985 Mass. Acts, Ch. 188, sec. 59; Massachusetts Laws Annotated, Ch. 15, sec. 59 (Lucretia Crocker Dissemination Program).